facile princeps in M. Lecoq de Boisbaudran's spectrum of the negative pole, and was therefore termed *a* by him, though to the confounding of his series of Greek letters in the positive pole's spectrum—I wrote of it in 1880 as "grand line peculiar to cyanogen," "the powerful violet line (viz. the above) at 59,405 W.N.B. inch, may become useful as a reference for place to many observers," and "grandly strong violet line, followed by a band; specially characteristic of cyanogen."

But a better view of the testimony of the whole case will be found in the above pair of tables, in the first of which I have collected, in a rude way of my own, all the lines and bands which are supernumerary in M. Lecoq de Boisbaudran's negative, as compared with his positive, pole; and in the second I have entered my former conclusions from gas-vacuum tube observations of what spectral lines and bands are peculiar to the compound gas cyanogen. C. PIAZZI SMYTH

15, Royal Terrace, Edinburgh, July 25

The Earliest Known Plotting Scale

THE Babylonian statues recently acquired for the Louvre by the mission of M. de Sarzec are of great interest in the history of measurement. The earliest datable measuring rods hitherto known are two Egyptian masons' cubits of wood, of the reign of Hor-em-heb in the fifteenth century B.C.; but on these statues we find represented not merely a mason's rod, but a finely-divided plotting scale, and the date of these figures is placed before the fifteenth century B.C. Of course the accurate lengths of cubits can easily be recovered from the dimensions of buildings of the earliest periods; but no measures, or accurate representations of such, are preserved to us from the primitive times.

There are several of these diorite statues of King Goudea in the Louvre, some rather less and some rather more than life size; all finely executed in a style superior to anything of the later times from Mesopotamia, with which we were already familiar. They are wrought by means of tubular drills and graving tools, by which lengthy and delicate inscriptions are cut all over the surfaces; the tools employed seem to have been very similar to those used by the early Egyptians for their statuary in diorite, which I recently described at the Anthropological Institute.

The statues which now concern us are two seated figures of an architect (or perhaps the king, as founder); these each bear on the knees a drawing board, 6·3 × 11·3 and 7·4 × 12·7 inches respectively. One board is plain, the other has an elaborate outline of a fortified town, showing all the buttresses and turns of the wall. By the right hand of each figure lies a drawing stylus, and along the front of each board a plotting scale, subdivided along both outer and inner face.

These scales have a sloping face along each side, like modern scales, but meeting in a ridge at the top, like French plotting scales, without a level space. The breadth is ·90, and height ·33 inch, sloping therefore about 36°; the length is just over 10½ inches, or half a cubit, the terminals being lines, with a small surplus beyond them.

The subdivisions vary on the different sides; but the general arrangement is a uniform series of spaces, which we will call digits; these are each $\frac{1}{16}$ of the half cubit, or ·653 inch. Then along one side of each rod the *alternate* digits are subdivided; thus there can be no confusion between digit lines and subdivisions. The dividing lines run the whole width of the face; they are about $\frac{1}{60}$ inch wide, and scored out nearly as deep into the diorite. The subdivisions are of halves, thirds, fourths, fifths, and sixths of a digit; and two sixths are carried over to the other side of the scale, and there further divided into twelfths and eighteenths of a digit; this last fraction being only $\frac{1}{28}$ of an inch.

By calculating a normal scale from the various digit lines (as described in "Inductive Metrology," p. 31) the average error of division may then be computed. It is about the same for the digits and also the subdivisions, varying on different sides from ·009 to ·013 inch; the mean error of all the digit marks is ·011 inch, or about half the breadth of a cut. But it is not to be expected that mere decorative representations like these would be divided with the same care as actual working scales. The mean value of the cubit deduced from these scales is 20·89 ± ·07 inch, which is apparently a long variant of the old 20·63 cubit, and not the later Assyrian cubit of 21·4 or 21·6.

The actual values of the divisions of the two sides of each scale are as follows, stating the amounts as differences from the normal scale in thousandths of an inch, which enables the variations to be most plainly seen. The points measured were about one-third from the bottom edge toward the top ridge.

Normal scale.		Without the plan.				With the plan.			
Digits.	Subdivisions	Outer.		Inner.		Outer.		Inner.	
		+	−	+	−	+	−	+	−
0		(. . .)		12		(. . .)		(. . .)	
·653			15		2	(. . .)		(. . .)	
1·306		(. . .)			20	(. . .)		(. . .)	
1·959		(. . .)			8	(. . .)		(. . .)	
2·612		(. . .)			26	(. . .)		(. . .)	
	$\frac{1}{2}$ 2·938	28		. . .		(. . .)		(. . .)	
3·265			9	2		12		11	
3·917			3	2		. . .		25	
	$\frac{1}{2}$ 4·244	. . .			9	. . .		18	
4·570		(. . .)		. . .		. . .		7	
5·223		(. . .)			8	. . .			11?
	$\frac{1}{3}$ 5·441	. . .		2		. . .		(. . .)	
	$\frac{1}{3}$ 5·658	. . .		4		. . .			1
5·876		(. . .)		4		. . .			1
6·529		(. . .)			5	. . .		8	
	$\frac{1}{4}$ 6·692	. . .		21		. . .		6	
	$\frac{1}{4}$ 6·855	. . .		25		. . .		3	
	$\frac{1}{4}$ 7·018	. . .		18		. . .			1
7·182		7		58			8		10
7·835		1		4		. . .		(. . .)	
	$\frac{1}{5}$ 7·966	. . .		3		. . .		8 ?	
	$\frac{1}{5}$ 8·096	. . .		2		. . .			7
	$\frac{1}{5}$ 8·227	. . .			3	. . .			13
	$\frac{1}{5}$ 8·357	. . .			5	. . .			22
8·488		11		0		. . .			7
	$\frac{1}{2}$ 8·814	. . .		. . .			25	. . .	
9·141			7		12		6		2
	$\frac{1}{6}$ 9·249	. . .			7	. . .			4
	$\frac{1}{6}$ 9·358	. . .			27	. . .			4
	$\frac{1}{6}$ 9·467		14		11	. . .			8
	$\frac{1}{18}$ 9·503		13	. . .		. . .		. . .	
	$\frac{1}{18}$ 9·539		11	. . .		. . .		. . .	
	$\frac{1}{18}$ 9·576		6	0		. . .			19
	$\frac{1}{6}$ 9·685	4		20		. . .			12
	$\frac{1}{12}$ 9·739	14		. . .		. . .		. . .	
9·793		19		20		(. . .)			21
10·446			5		24	(. . .)		(. . .)	

The plain dots show that there was no mark; the dots in brackets where a mark is defaced, or the whole surface destroyed. The great error of ·058 inch is due to a cut run askew, the line being as accurate as the others on the outer face of the rod.

I am indebted to M. Ledrain for kindly granting me permission to take the measurements from these statues.

Bromley, Kent W. M. FLINDERS PETRIE

A Result of our Testimonial System

A LITTLE incident has come under my notice of such a character that I think it ought to be made known to the readers of NATURE.

A candidate, whom I will call Mr. A. B., for a vacant scientific chair in this country writes to an eminent German professor for a "testimonial," and in his letter there occurs the following remarkable sentence:—

"... 17 *July*, '83

"DEAR SIR,—I intend applying for the vacant chair of ... at ..., and would feel grateful if you could send me a testimonial saying a few favourable things of my contributions to the science of ...

"... I hope that you will not think me too bold in asking this request, and as I know your time is too valuable to be trespassed on by a stranger, *I beg that you will accept the inclosed.*"

The German professor, whom I will call Prof. C., thereupon writes to a distinguished English professor, who is a personal friend of his, the following letter, which has been placed in my hands with the request that I will add a few comments. The letter, which I give in its original language in order that none of its force may be lost, runs as follows:—

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". . . 23 *Juli*, 1883

"Verehrter Herr College,—Ihre freundliche Gesinnung gegen mich, ermuthigt mich, Ihnen folgenden Fall vorzutragen, mit der Bitte möglichst viele Ihrer Herrn Collegen und, wenn Sie es für gut halten, auch die Presse davon in Kenntniss zu setzen.

"Ich hatte schon öfter aus England Briefe erhalten von Candidate für irgendwelche . . . Professur mit der Bitte ein Zeugniss ueber ihre Leistungen anzustellen. Ich habe, da mir diese Art der Bewerbung, wie sie in England leider gebräuchlich ist, im höchsten Grade zuwider, meist derartige Schreiben gar nicht beantwortet. Neulich erhielt ich nun aber einen Brief aus . . . von einem gewissen . . . der an Schamlosigkeit Alles uebersteigt, zum Mittel der Bestechung greift. Es klingt unglaublich, aber Herr . . . ist so schamlos, mir als Preis für ein Empfehlungschreiben *Geld anzubieten*. Damit Sie sich selbst davon ueberzeugen können, sende ich Ihnen das Original mit der ergebensten Bitte mir dasselbe nach gewonnener Einsicht bezw. Abschrift, wieder zurückzusenden. Eingelegt war eine Anweisung auf 1 guinea! Letztere sende ich heute ohne Brief recommandirt an . . . zurück. Ich habe Beider hier meinen Freunden gezeigt und werde auch vor Zeugen die Rücksendung der Anweisung auf 1 Guinea vornehmen.

"Ich glaube, verehrter Herr College, dieser Fall ist dazu angethan, weiteren Kreisen mitgetheilt zu werden, um zu verhindern dass ein solch erbärmlicher Mensch wie . . . etwas die Stelle in . . . erhalte. Ihnen im voraus für Ihre Mühe dankend mit vorzüglichste Hochachtung.

"Ihr Ergebenster, . . ."

I imagine that all Englishmen on reading the above will, like myself, be filled with shame that any one speaking our tongue should have laid himself open to such a rebuke.

At the same time it seems to me quite possible that Prof. C.'s view of the matter is unduly severe and indeed unjust. I do not know Mr. A. B. personally, and am quite ignorant of what character he bears; but I can conceive that he has fallen into this disgrace through a clumsy attempt to carry out to its logical conclusion our English system of testimonials. He can hardly have thought that so distinguished and successful a man as Prof. C. could be *bribed* to say something handsome by a post-office order for *one guinea;* and he cannot be so ignorant as not to be aware of the just pride which all Germans feel in the integrity and honour of their professoriate; it is quite open for us to suppose that he was really offering Prof. C. *a fee for a professional service*. And really when you come to think of it, this is a point of view for which something may be said. Only last week, in talking to a colleague about testimonials, I asked him how many testimonials he wrote on an average a week. He replied that he thought *not more than a dozen or fifteen*. In fact when a man, especially one who has spent some years in teaching, has acquired a certain reputation in science, the tax upon his time and energy for the skilful composition and writing of appropriate testimonials amounts during his lifetime to a something which, converted at the market value of his powers into pounds, shillings, and pence, would appear no mean sum.

Now—and this is the kernel of the matter—no one would grudge time spent in assisting a deserving man to get into a place for which he was fitted; but our testimonial system has nowadays reached such dimensions that only a few of the testimonials written have this end in view. I am writing freely, because this is a very serious matter, and one which I have much at heart; I therefore do not hesitate to say, what indeed is well known, that great skill has been reached by many in the art both of writing and reading testimonials. Many testimonials are framed after that well-known formula for acknowledging the receipt of pamphlets which runs as follows:—"Dear Sir,—I beg to thank you for the valuable pamphlet which you have so kindly sent me, and which I will lose no time in reading." And I heard the other day a testimonial praised because it showed the electors whom not to elect.

Surely the time has come to consider whether this plague of testimonials (for it is hardly less) cannot in some measure be stayed. At all events, cannot in higher places at least some steps be taken to mend matters? When such a post as a professorship is vacant, it is the duty of the electors to make themselves acquainted with the manner of man wanted and to find him; our present plan lays upon all persons connected with the subject of the chair the burden of trying to enlighten the electors as to the claims of this or that candidate. A passage in Prof. C.'s letter shows how degrading the Germans think our method; and it is not agreeable to Englishmen to read such passages. Yet every one who has had to struggle for a post with testimonials must feel that such criticisms are just, and that the process is one distasteful to a right-minded man. And it is also unnecessary. I, for one, would rejoice to see the German system of a "call" introduced into our professorial elections; but if we cannot obtain this, let us at least do away with testimonials. In the recent elections at the University of Cambridge, the following significant phrase occurred in the announcements of the vacancies: "testimonials, *if any*, to be addressed, &c."; and as a matter of fact, in the cases of the four chairs recently filled up on the new system, the man chosen in each case had sent in no testimonials. Why cannot this be done in all elections to professorial chairs? Where, as may sometimes be the case, the candidates are previously not all thoroughly known, the electors, by reference, formal or otherwise, can easily make themselves acquainted with their relative merits; and indeed, as I just now said, it is their duty to make such inquiries, and not simply to collate, interpret, and form their decisions on the curious documents which we call testimonials.

Hence, though I venture to send this communication to NATURE for the purpose of making an example of Mr. A. B.'s post-office order for one guinea, I cannot help thinking that he, though sinning, is also sinned against, and that our system of testimonials is to be blamed as well as he. M. FOSTER

Birds and Cholera

YOU ask in one of your "Notes" (p. 329), what can be the cause of birds leaving a locality before the approach of cholera? The following anecdote may be of interest, but I of course cannot vouch for its having any real connection with the subject. It must have been in the summer of 1848 that I was invited to meet a party at my uncle's house in the Close at Salisbury, on the occasion of the visit of the Antiquarian Society. On arriving I found the cholera raging, and the party put off. There were in the house only the gardener and his wife, whom, having been previously servants to my father, I had known from my childhood. The gardener told me that, just before the outbreak of the disease, the man whose duty it was to oil the vane upon the spire had made his annual ascent (of 404 feet), and had perceived a foul scent, which, it seems, had not been noticed below. The inhabitants connected this with the appearance of the epidemic shortly afterwards. Birds might no doubt be affected by such a circumstance. O. FISHER

THIS has been remarked before. It is recorded of the great outbreak of cholera at Salisbury in 1849—can any of your correspondents say where?—that an officer recently from India, happening to make the ascent of the Cathedral, exclaimed suddenly, "I smell cholera!" Immediately afterwards the outbreak followed, when it was observed that the birds (swallows are especially in my remembrance) had fled the neighbourhood. If these two incidents are to be trusted, it can scarcely be doubtful that there is a connection between them. HENRY CECIL

Bregner, Bournemouth, August 6

YOU will find a very interesting but rather sceptical paper on the supposed connection of birds leaving towns with invasions of cholera (NATURE, vol. xxviii. p. 329), by Pfarrer Häckel of Windsheim, in the monthly journal, *Der zoologische Garten* (Bavaria), September, 1873 (vol. xiv. p. 328), published by the Zool. Gesellschaft of Frankfort-on-Main. D. WN.

Freiburg, Badenia, August 4

Animal Intelligence

SEVERAL remarkable instances of intelligence in animals have been given in recent numbers of NATURE. Possibly the following instance of reasoning power in an elephant may not be without interest:—Some years ago I was ascending the lower part of the Darjeeling Hill Road, in the Himalaya Mountains, from Terai. At a certain part of the road, where we met a string of bullock carts, the outer few feet was encumbered by a long flat-topped heap of small rounded boulders, piled there to be broken up for road metal; from the outer edge there was a steep, almost precipitous, slope. On the inner side of the road was a small drain, and then a few feet of comparatively level ground between the drain and the slope above. The carts just mentioned were of the usual kind, the body (constructed of bamboo) about

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